

RESPONSE UNDER 37 C.F.R. § 1.116

EXPEDITED PROCEDURE – Art Unit 2811

Attorney Docket No. 108298737US

Disclosure No. 03-0675.00/US

Amendments to the Claims:

Please amend claims 14-25, and cancel claim 13. Following is a complete listing of the claims pending in the application, as amended:

1. (Previously presented) A method for processing a microelectronic device, comprising:

fabricating a plurality of dies at an active side of a microelectronic workpiece, the dies having integrated circuitry and bond-pads coupled to the integrated circuitry;
constructing a redistribution assembly at the active side of the workpiece before separating the dies by depositing a dielectric layer over the dies and forming conductive elements having traces connected to corresponding bond-pads on the dies and ball-pads arranged in ball-pad arrays;
covering a backside of the workpiece with a protective material in a flowable state before separating the dies; and
curing the protective material to create a protective layer on the backside of the workpiece.

2. (Original) The method of claim 1, further comprising:

attaching a plurality of solder balls to the ball-pads; and
covering the dielectric layer with an active side protective film that surrounds at least a portion of the solder balls.

3. (Original) The method of claim 1 wherein covering the backside of the workpiece comprises stencil printing the material onto the backside of the workpiece.

4. (Original) The method of claim 1 wherein covering the backside of the workpiece comprises spraying the material onto the backside of the workpiece.

5. (Original) The method of claim 1 wherein covering the backside of the workpiece comprises spin coating the material onto the backside of the workpiece.

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6. (Original) The method of claim 1 wherein covering the backside of the workpiece comprises applying the material onto the backside of the workpiece in a dip bath.

7. (Original) The method of claim 1 wherein curing the material comprises heating the material in an environment at a temperature of approximately 50°C to 500°C for approximately 15-150 minutes.

8. (Original) The method of claim 1 wherein curing the material comprises heating the material in an environment at a temperature of approximately 150°C to 250°C for approximately 15-120 minutes.

9. (Original) The method of claim 1 wherein curing the material comprises heating the material in an environment at a temperature of approximately 150°C for approximately 120 minutes.

10. (Original) The method of claim 1 wherein curing the material comprises heating the material in an environment at a temperature of approximately 200°C for approximately 15 minutes.

11. (Original) The method of claim 1 wherein curing the material comprises heating the material in an environment at a temperature of approximately 250°C for approximately 60 minutes.

12. (Original) The method of claim 1 wherein the material is a polyimide, epoxy-based, and/or modified silicone material.

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13. (Cancelled)

14. (Currently amended) A method for protecting a microelectronic device, the method comprising: ~~The method of claim 13, further comprising:~~

providing a microelectronic workpiece having an active side, a backside, and a plurality of dies at the active side of the workpiece, wherein the dies include integrated circuitry and bond-pads coupled to the integrated circuitry;

providing a redistribution assembly at the active side of the workpiece, the redistribution assembly having a dielectric layer over the dies, ball-pads arranged in ball-pad arrays corresponding to the dies, and traces coupling the bond-pads of a die to the ball-pads of a corresponding ball-pad array;

covering the backside of the workpiece with a coating of protective material in a flowable state before separating the dies;

changing the protective material to a non-flowable state;

attaching a plurality of solder balls to the ball-pads; and

covering the dielectric layer with a protective film that surrounds at least a portion of the solder balls.

15. (Currently amended) The method of claim ~~13-14~~ wherein covering the backside of the workpiece comprises stencil printing the material onto the backside of the workpiece.

16. (Currently amended) The method of claim ~~13-14~~ wherein covering the backside of the workpiece comprises spraying the material onto the backside of the workpiece.

17. (Currently amended) The method of claim ~~13-14~~ wherein covering the backside of the workpiece comprises spin coating the material onto the backside of the workpiece.

18. (Currently amended) The method of claim ~~13-14~~ wherein covering the backside of the workpiece comprises applying the material onto the backside of the workpiece in a dip bath.

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19. (Currently amended) The method of claim 13-14 wherein changing the protective material to a non-flowable state comprises curing the material by heating the material in an environment at a temperature of approximately 50°C to 500°C for approximately 15-150 minutes.

20. (Currently amended) The method of claim 13-14 wherein changing the protective material to a non-flowable state comprises curing the material by heating the material in an environment at a temperature of approximately 150°C to 250°C for approximately 15-120 minutes.

21. (Currently amended) The method of claim 13-14 wherein changing the protective material to a non-flowable state comprises curing the material by heating the material in an environment at a temperature of approximately 150°C for approximately 120 minutes.

22. (Currently amended) The method of claim 13-14 wherein changing the protective material to a non-flowable state comprises curing the material by heating the material in an environment at a temperature of approximately 200°C for approximately 15 minutes.

23. (Currently amended) The method of claim 13-14 wherein changing the protective material to a non-flowable state comprises curing the material by heating the material in an environment at a temperature of approximately 250°C for approximately 60 minutes.

24. (Currently amended) The method of claim 13-14 wherein changing the protective material to a non-flowable state comprises curing the material using rapid thermal processing.

25. (Currently amended) The method of claim 13-14 wherein the material is a polyimide, epoxy-based, and/or modified silicone material.

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26. (Previously presented) A method for fabricating a microelectronic device, comprising:

providing a microelectronic workpiece having an active side and a backside, the microelectronic workpiece having a plurality of dies at the active side, the dies including integrated circuitry and bond-pads coupled to the integrated circuitry; fabricating a redistribution layer before separating the dies from each other, the redistribution layer having a dielectric layer over the dies, ball-pads arranged in ball-pad arrays corresponding to the dies, and traces coupling the bond-pads of a die to the ball-pads of a corresponding ball-pad array; covering the backside of the workpiece with a protective material in a flowable state before separating the dies from each other; and curing the protective material to create a protective layer on the backside of the workpiece.

27. (Original) The method of claim 26, further comprising:

attaching a plurality of solder balls to the ball-pads; and covering the dielectric layer with a protective film that surrounds at least a portion of the solder balls.

28. (Original) The method of claim 26 wherein covering the backside of the workpiece comprises stencil printing the material onto the backside of the workpiece.

29. (Original) The method of claim 26 wherein covering the backside of the workpiece comprises spraying the material onto the backside of the workpiece.

30. (Original) The method of claim 26 wherein covering the backside of the workpiece comprises spin coating the material onto the backside of the workpiece.

31. (Original) The method of claim 26 wherein covering the backside of the workpiece comprises applying the material onto the backside of the workpiece in a dip bath.

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32. (Original) The method of claim 26 wherein curing the material comprises heating the material in an environment at a temperature of approximately 50°C to 500°C for approximately 15-150 minutes.

33. (Original) The method of claim 26 wherein curing the material comprises heating the material in an environment at a temperature of approximately 150°C to 250°C for approximately 15-120 minutes.

34. (Original) The method of claim 26 wherein curing the material comprises heating the material in an environment at a temperature of approximately 150°C for approximately 120 minutes.

35. (Original) The method of claim 26 wherein curing the material comprises heating the material in an environment at a temperature of approximately 200°C for approximately 15 minutes.

36. (Original) The method of claim 26 wherein curing the material comprises heating the material in an environment at a temperature of approximately 250°C for approximately 60 minutes.

37. (Original) The method of claim 26 wherein curing the material comprises changing the material from a flowable state to a non-flowable state using rapid thermal processing.

38. (Original) The method of claim 26 wherein the material is a polyimide, epoxy-based, and/or modified silicone material.

39-69. (Cancelled)